1988 WL 265300 (F.R.)

NOTICES

DEPARTMENT OF ENERGY

Alternative Cooling Water Systems, Savannah River Plant, Aiken, SC; Record of Decision

Friday, February 12, 1988

***4203** The Department of Energy (DOE) has prepared this Record of Decision pursuant to regulations of the Council on Environmental Quality (40 CFR Part 1505) and Implementing Procedures of the Department of Energy (52 FR 47662, December 15, 1987). This Record of Decision is also based on DOE's issuing a Draft Environmental Impact Statement, Alternative Cooling Water Systems, Savannah River Plant, Aiken, South Carolina (DOE/EIS-0121D), holding public hearings on the Draft EIS, completing the Final EIS (DOE/EIS-0121), and distributing approximately 750 copies to Congress, state and Federal agencies, and concerned individuals. In addition, DOE has considered all public and regulatory comments received on the final EIS in the preparation of this Record of Decision.

DOE originally supported the once-through alternative. However, comments received from the Environemental Protection Agency (EPA) in a letter to DOE dated December 3, 1987, stated that the once-through alternative does not assure the "protection and propagation of a balanced indigenous population of shellfish, fish and wildlife." The State of South Carolina reinforced the EPA's opinion in a letter to DOE dated December 4, 1987. Both the State of South Carolina, as well as EPA, feel that the recirculating cooling alternative is the only Permittable (and, therefore, environmentally preferable) alternative. However, both the State of South Carolina and EPA feel that the environmentally preferred alternative for the D Area powerhouse is the DOE preferred alternative of increased flow with mixing.

Decision

DOE has decided to construct and operate (subject to the authorization and appropriation of funds by Congress) recirculating cooling towers for both K-and C-Reactors and to implement increased flow with mixing for the D-Area powerhouse at the Savannah River Plant (SRP). The implementation of cooling water systems for major sources of thermal effluents at the SRP will enable compliance with the thermal provisions of the Federal and State water quality standards and with a Consent Order (84-4-W) dated January 3, 1984, and amended on August 27, 1985, August 31, 1987, January 4, 1988, and January 29, 1988, between DOE and the South Carolina Department of Health and Environmental Control (SCDHEC). In accordance with the amended Consent Order, DOE will construct the cooling water system for K-Reactor first because C-Reactor is shut down for an extended period. DOE will notify SCDHEC immediately if it determines that C-Reactor is to restart and will propose a timely schedule for construction of its cooling water system. Because the implementation of the increased-flow-with-mixing alternative for D-Area would not require any construction activities, DOE will implement it immediately.

Cooling water discharges from the recirculating cooling towers at K- and C- Reactors will be required to comply with two water temperature conditions specified in the National Pollutant Discharge Elimination System (NPDES) permit issued by the State of South Carolina: (1) a maximum instream temperature of 32.2° C (90° F at all times and (2) a maximum allowable rise in the stream temperature of 2.8° C (5° F). Cooling water discharges would comply with the first condition (i.e., maximum instream temperature of 32.2° C) at all times. Because the effluent discharge occasionally would raise the ambient

stream temperatures by more than 2.8° C, DOE would perform Section 316(a) Demonstration studies to verify that a balanced biological community would be maintained in the affected stream system and, would support the request for a variance of this condition from SCDHEC.
Cooling water discharges associated with the increased flow with mixing alternative for the D-Area powerhouse also would comply with the NPDES permit for a maximum instream temperature of 32.2' C. At times the discharge from the powerhouse would affect the ambient stream temperature by more than the maximum allowable 2.8° C rise. Therefore, DOE will perform a section 316(a) Demonstration study to verify that a balanced biological community would be maintained in the stream system and, thus would also request a variance of this condition from SCDHEC.

Background

The Savannah River Plant is located in southwestern South Carolina. The Plant occupies an area of approximately 780 square kilometers (192,741 acres), bounded on its southwestern side by the Savannah River, which is also the border between the States of South Carolina and Georgia. The SRP is a controlled-access, major DOE installation established in the early 1950s for the production of nuclear materials for national defense. Plant facilities, which can be characterized as heavy industry, consist of five production reactors (K-, L-, and P-Reactors are operational, R-Reactor is in standby condition, and C-Reactor is in an extended shutdown), two chemical separations areas, a fuel and target fabrication facility, and various supporting facilities.
The major sources of thermal effluents at the SRP are the cooling water discharges from the production reactors and an onsite coal-fired powerhouse. K- and C-Reactors discharge their cooling water directly to Pen Branch and Four Mile Creek, respectively. The coal-fired powerhouse in D-Area discharges cooling water from cooling-system condensers into an excavated canal that flows into Beaver Dam Creek.
An onsite 2700-acre cooling lake, Par Pond, cools the thermal effluent from P- Reactor. DOE has conducted section 316(a) and 316(b) studies, as required by the Federal Water Pollution Control Act, as amended (33 U.S.C. 1326), and submitted the results of these studies to SCDHEC. On May 14, 1987, SCDHEC concurred with DOE's conclusions that balanced indigenous populations of fish, shellfish, and wildlife exist in Par Pond and that the present operations of P- Reactor pose no threat to the continued existence of a balanced indigenous biological community. L-Reactor discharges its thermal effluent to a 1000- acre cooling lake. DOE has submitted Predictive section 316(a) studies that indicate the probable exhistence of balanced biolgoical communities on and in the cooling lake to SCDHEC, which has approved them. DOE has described the restart of L-Reactor and the use of the cooling lake extensively in the Environmental Impact Statement, L-Reactor Operation, Savannah River Plant (DOE/EIS-0108).
SCDHEC issued a renewed NPDES permit (number SC0000175) for SRP operations, which became effective on January 1, 1984. The purpose of this permit is to regulate the Plant's discharges of wastewater--including cooling water--to surface streams and other water bodies. As stated in the permit, cooling water discharge temperature limits for K- and C-Reactors and the D-Area powerhouse are not to exceed an instream temperature after mixing of 32.2° C; in addition, the ***4204*** effluents must not raise the temperatures of the affected streams more than 2.8° C above their ambient temperatures, unless a section 316(a) Demonstration study can determine the maintenance of a balanced biological community.
To achieve compliance with these temperature limitations, on January 3, 1984, DOE and SCDHEC entered into a mutually agreed-on Consent Order (84-4-W). This order temporarily superseded the temperature requirements in the NPDES permit and established a process for attaining compliance. Key elements of this process required DOE to: (1) Complete a "Comprehensive Cooling-Water Study" of the thermal effects of operations at the Savannah River Plant, (2) complete and submit a Thermal Mitigation Study to SCDHEC, (3) submit and actively support funding requests to accomplish any

actions resulting from the Thermal Mitigation Study, and (4) undertake work on the alternatives approved by SCDHEC, under a schedule to be established in an amendment to the Consent Order, subject to the appropriation of funds by Congress.
In compliance with the Consent Order, DOE submitted the Thermal Mitigation Study (DOE-SR-5003) to SCDHEC on October 3, 1984, the Comprehensive Cooling- Water Study, Annual Report (DP-1697) in July 1985, and the Comprehensive Cooling-Water Study, Final Report (DP-1739) in November 1987.
On August 27, 1985, DOE and SCDHEC agreed on an amendment to Consent Order 84-4-W that established a compliance schedule for the completion of National Environmental Policy Act (NEPA) documentation by December 31, 1986. This amendment also established an implementation schedule for the start of construction of a selected cooling water system for C-Reactor on or before September 30, 1987, and completion of construction on or March 31, 1989. The amendment established the date for the start of construction of a system for K- Reactor on or before before September 30, 1987, and completion of construction on or before July 31, 1989. The Consent Order also established March 31, 1987, as the date by which DOE must submit a plan of study and an approvable schedule for the implementation of a cooling water system for the D-Area powerhouse. In compliance with the amended Consent Order, DOE published a Notice of Availability (51 FR 10652, March 27, 1986) and submitted a copy of the Draft Environmental Impact Statement (DOE/EIS-0121D) to SCDHEC on March 28, 1986.
On October 29, 1986, DOE and SCDHEC agreed that it would be necessary to change the schedule in the amended Consent Order. DOE requested this change to respond to significant comments on the Draft EIS received from SCDHEC and the U.S. Environmental Protection Agency (EPA). On August 31, 1987, DOE and SCDHEC agreed on a second amendment to the Consent Order, which establishes a compliance schedule for the completion of NEPA documentation by October 31, 1987, which was done accordingly. This amendment also specifies that DOE must submit plans and specifications to SCDHEC for the K-Reactor mitigation alternative on or before September 30, 1988, subject to the authorization of and appropriation of funds by Congress. In addition, this amendment establishes an implementation schedule for the start of construction of a selected cooling water system for K-Reactor on or before February 28, 1990, and completion of construction on or before December 31, 1992. The amended Consent Order also establishes March 31, 1988, as the date by which DOE must submit a plan for a section 316(a) Demonstration study and an approvable schedule for the implementation of a cooling water system for the D-Area powerhouse. Finally, the amended Consent Order states that DOE shall notify SCDHEC immediately if it determines that C-Reactor is to restart, and shall propose a timely schedule for the construction of its thermal mitigation alternative. However, DOE recognizes that the change in the preferred alternative from a once-through system to a recirculating system will not allow DOE to meet the compliance schedule in the present Consent Order. Therefore, it will be necessary to renegotiate the Consent Order with SCDHEC.
DOE must implement cooling water system alternatives at K-Reactor and the D-Area powerhouse to comply with both South Carolina water classification standards [as contained in the NPDES permit (number SC0000175)] and Consent Order 84-4-W.

Description of Alternatives

As described in the Final Environmental Impact Statement, Alternative Cooling Water Systems, Savannah River Plant, Aiken, South Carolina (DOE/EIS-0121), October 1987, DOE's proposed action is to construct and operate cooling towers for K- and C-Reactors and to implement increased flow with mixing for the D- Area powerhouse. The alternatives that DOE considered in this FEIS to reach its decision include once-through and recirculating cooling towers for K- and C-Reactors and increased flow with mixing and direct discharge to the Savannah River for the D-Area powerhouse.
Initially, DOE identified 22 possible cooling water systems that could potentially meet the South Carolina Class B water classification standards for K- and C-Reactors and the D-

Area coal-fired powerhouse, and documented them in the Thermal Mitigation Study (DOE-SR-5003). Based on a structured screening process and comments received on its Notice of Intent to prepare an environmental impact statement, and through the EIS scoping process, DOE decided to consider once-through and recirculating cooling towers for K- and C- Reactors, and increased-flow with mixing and direct discharge to the Savannah River for the D-Area powerhouse. In addition, DOE has considered the No-Action alternative in accordance with the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act. DOE has selected the environmentally preferred alternative, which is to construct and operate a recirculating system using cooling towers. This system would discharge only blowdown water to the stream.

Basis for Decision

In compliance with NEPA, DOE has analyzed the environmental impacts of many mitigation alternatives associated with the proposed construction and operation of modified cooling water systems for K- and C-Reactors and the D-Area powerhouse, as described in the FEIS. DOE considered all the comments it received on the Draft EIS in the preparation of the FEIS, which contains DOE's responses to those comments.
In addition to these considerations and in accordance with the amended Consent Order, DOE will construct the cooling water system for K-Reactor first because C-Reactor is in an extended shutdown. DOE will notify SCDHEC immediately if it determines that C-Reactor is to restart and will propose a timely schedule for the implementation of its cooling water system. The following discussion of mitigation alternatives and considerations in implementation deals only with K-Reactor and the D-Area powerhouse.
For each of the three facilities, the selection of the No-Action alternative would result in a continuation of present cooling water discharges that do not comply with the State of South ***4205*** Carolina's Class B water classification standard of a maximum instream temperature of 32.2 ° C. The construction and operation of either once-through or recirculating towers for K-Reactor, and the implementation of either increased flow with mixing or the construction and operation of a direct-discharge system to the Savannah River for the D-Area powerhouse, would result in discharges that would comply with this standard. However, the construction and operation of recirculating cooling towers for K-Reactor and the implementation of increased flow with mixing for the D-Area powerhouse also would require the performance of section 316(a) Demonstration studies to verify that balanced biological communities would be maintained in the affected streams, because discharges from these alternatives would exceed the Class B water classification standard of a maximum instream ambient temperature rise of 2.8 ° C.
The present-worth cost estimate presented in the FEIS for once-through cooling tower systems for K-Reactor ($41.4 million) would be approximately $16.6 million less than that for recirculating cooling towers ($58 million). These estimates do not include the loss of production associated with reduced reactor power. The implementation of the once-through cooling-tower system would cause a 0.2-percent annual average loss of reactor power, which would result in a present-worth cost estimate of $43 million; the implementation of the recirculating system would cause a 3.7-percent power loss, which would result in a present-worth cost estimate of $90 million. Therefore, including production losses, the once-through cooling-tower system for K-Reactor would cost approximately $47 million less than the recirculating system. However, recirculating cooling towers would cost about $2 million less to operated each year than once-through systems because they would use less electricity to pump water from the Savannah River. Therefore, in 15 years this cost savings would result in a net savings of approximately $30 million, which would then make the once-through cooling-tower system about $17 million less to construct and operate than the recirculating system. The recirculating system would never have to reduce power during the summer in order to meet the NPDES maximum allowable discharge temperature as may occur with the once-through system. In addition to these costs and operating mode, the construction of the

recirculating system would take approximately 6 months longer than the once- through system.

The principal environment benefit of once-through cooling towers would be the maintenance of existing flow levels in the creeks and deltas, which would provide more potential aquatic habitat for fish and other organisms. The principal benefits of constructing and operating recirculating cooling towers would be the reestablishment of a greater amount of wetlands (about 1500 acres), the reduction in entrainment and impingement losses by 85 percent each, and the establishment of a potentially greater amount of foraging habitat for the wood stork (an endangered species). In view of these facts and the concerns expressed by the regulators, the once-through alternative does not balance favorably against the recirculating alternative; therefore, DOE has not selected it.

For the D-Area powerhouse, the analysis in the FEIS indicates that both the environmentally preferred alternative and DOE's preferred alternative are increased flow with mixing. The principal environmental benefit of this alternative over the direct-discharge alternative would be the maintenance of existing water levels in Beaver Dam Creek, which would provide more habitat for the endangered wood stork and other aquatic organisms. This alternative also would avoid adverse impacts to about 1 acre of wetlands and 5 acres of uplands that would result from the construction of the direct-discharge pipeline. There would also be an initial cost savings of about $14 million, and savings of about $20,000 per year in operational costs thereafter. In addition, the preferred alternative could be implemented immediately, while the direct- discharge alternative would require about 22 months for construction. Because of its higher construction and operating costs, the longer schedule for implementation, adverse impacts to wetlands, and the potential reduction in habitat for the endangered wood stork caused by the reduced flow, DOE has not selected the direct-discharge alternative.

Considerations in the Implementation of the Decision

DOE will design, build, and operate the recirculating cooling-tower system for K-Reactor in compliance with its standards. DOE will design and operate the cooling tower such that it meets the maximum weekly average temperature criteria established by EPA [FN1] to minimize thermal shock to fish, which could occur during a reactor shutdown. Measures to minimize potential environmental impacts include sound engineering design, proper construction practices (e.g., erosion and storm runoff control to minimize aquatic impacts), and an effective quality assurance program. Construction activities at K-Reactor would disturb approximately 50 acres of uplands, and cannot be avoided. After construction of the cooling tower, DOE will replant areas that will not be used with native grasses, shrubs, or trees. The final site layout and design of the cooling towers, effluent canal, service roads, and parking areas will include all practicable methods of mitigating environmental impacts. The implementation of the preferred alternative for the D-Area powerhouse would not involve construction activities.

FN1 Environmental Protection Agency, 1977. Temperature Criteria for Freshwater Fish; Protocol and Procedures, EPA-600/3-77-061, Duluth, Minnesota.

Conclusion

DOE has weighed the costs, benefits, schedule, and environmanetal impacts in its decision to implement a cooling-water system that will comply with the thermal provisions of the State of South Carolina's Class B water Classification standards (as contained in the NPDES permit) and with Consent Order 84-4-W between DOE and SCDHEC. Through this analysis, DOE has selected the construction and operation of a recirculating cooling tower system for K- Reactor, and the implementation of the increased flow with mixing alternative for the D-Area powerhouse. These are the environmentally preferred alternatives. DOE will proceed with this decision subject to the

authorization and appropriation of funds by Congress.
Dated: February 10, 1988.

Troy E. Wade II,

Acting Assistant Secretary for Defense Programs.

[FR Doc. 88-3234 Filed 2-11-88; 8:45 am]

BILLING CODE 6450-01-M

53 FR 4203-01, 1988 WL 265300 (F.R.)
END OF DOCUMENT